

The opinion in support of the decision being entered today was not written for publication and is not binding precedent of the Board

Paper No.

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte YONG-GEUN KIM

Appeal No. 1999-0344
Application 08/250,770

HEARD: January 24, 2001

Before THOMAS, HAIRSTON, and LEVY, Administrative Patent Judges.

THOMAS, Administrative Patent Judge.

ON REQUEST FOR REHEARING

This is a decision on rehearing of our original decision in this appeal dated February 12, 2001, in which we sustained the rejection of claims 1-24 under 35 U.S.C. 103. Appellant's request for rehearing was filed on April 11, 2001. In this request, appellant presents arguments only with respect to claim 1, since the statement is made that all remaining claims 2-24 stand or fall with claim 1 at page 6 of the request.

Page 7 of appellant's request states that the admitted prior art utilized a single light emitting element, i.e., a laser diode. This is a more explicit statement as to what appellant's admitted prior art utilized than we perceived from our original understanding of the invention in the specification as filed as it pertained to prior art Figure 1. Appellant presents the view at the bottom of page 8 of the request that the laser diodes of the admitted prior art ideally printed a document with even toner density throughout the document due to the use of one laser diode. Appellant also states at page 10 of the request that in the admitted prior art, it was understood and well known in the art that a laser printer has high resolution and printed a document with even toner density. Appellant also characterizes, at the bottom of page 9 of the request, that the problem associated with the admitted prior art was directed to the amount of toner attached on the drum during a developing stage being determined by a bias voltage, where the intensity of this bias voltage was controlled by the user by adjusting a terminal on a control panel. This is consistent with our understanding from the identified portions of the admitted prior art in the specification that we noted at the top of page 4 of our original opinion. The user's changing of the bias voltage was characterized at page 10 of the request as merely changing the density of the toner on the printed document not the uniformity of the density.

With respect to appellant's admitted prior art Figure 1, it is stated at the bottom of page 9 of the specification as filed that the bias voltage generator unit 70 had the adjusting terminal for adjusting the bias of that circuit. The adjusting terminal was stated to be well known as a print density select switch on the control panel.

On the other hand, whereas appellant's admitted prior art Figure 1 shows a clock generator 40 and a dividing unit 50 to feed clocking signals to the data transmitting unit 10, appellant utilizes a selectable first and second divider circuit in Figure 3 in part controlled by the mode selector and the data coming in on the bus to the left of that figure. Additionally, the chopping unit 100 has been added between the data transmitting unit 10 and the print control unit 20 as shown in Figure 3 as compared with the prior art Figure 1. As stated in the paragraph bridging pages 3 and 4 of our original opinion, Figure 1 does not teach at all the claimed chopping means operating in accordance with the second clock signal, where the chopping means in turn causes the printing control means to be responsive to that data generated by the chopping means clause of claim 1. However, it is noted that we did state that the bulk of the subject matter of independent claim 1 on appeal was shown in prior art Figure 1 including the data transmitting means clause, substantially all of the printing control means clause

except for the responsive language to the chopped data, and the print control means generating the horizontal sink signal at the end of claim 1 on appeal.

In response to appellant's presentation for the first time in the request for rehearing further information about what appellant's admit to being in the admitted prior art Figure 1, as well as what the laser printing arts generally recognize, we have reconsidered our original opinion but come to the same conclusion as to the unpatentability of the subject matter of claim 1 within 35 U.S.C. § 103 based upon the same applied prior art, appellant's admitted prior art Figure 1, in view of Tomita and Hayashi. In light of the new emphasis presented in the request as outlined earlier, the importance of the Hayashi reference becomes paramount. Since the admitted prior art Figure 1 utilizes a laser as a light source for the laser beam of the claim, the corresponding teachings of Hayashi are more significant than ever. Figures 1A and 1B of Hayashi correspond to a complete laser imaged electrophotographic printing system, only part of which is correspondingly shown in appellant's prior art Figure 1.

In contrast to the prior art approach associated with appellants's prior art Figure 1 permitting the user to change the bias voltage of the generator 70, appellant's disclosed invention in representative Figure 3 takes the approach of controlling the amount of light illuminating the photosensitive drum by chopping the video data to

adjust the density of the printed images by designating or selecting the data defining the amount of light exposed in accordance with software as set forth in the summary of the invention at the middle of page 6 of the specification as filed. It is stated there that the sharpness of the printed images may be easily adjusted without adjusting the bias voltage of the developing unit. This is brought out in more detail in the discussion in the paragraph bridging pages 13 and 14 of the specification as filed.

In a corresponding manner, the discussion of pertinent portions of Hayashi indicates a similar approach notwithstanding the focus of Hayashi's invention being to make his image forming apparatus more responsive to environmental conditions such as humidity. Even as revealed in the abstract of Hayashi's disclosure, the control circuitry regulates the amount of light of the exposure apparatus, including operation in accordance with the output of the humidity detector. This is consistent with the normal operation of the circuitry associated with Hayashi's invention. The printing unit 20 in Figure 1B operates upon taking the provided image signals from the reader 100 "after pulse width modulation etc., for driving the laser element." (column 4, lines 40-43). This is detailed more in the discussion beginning at column 5 associated with Figure 2 and the corresponding discussion of Figures 16 and 14-1 and 14-2 beginning at column 5, line 31. At least the discussion at column 6 of Hayashi indicates that the amount light

emission from a laser is a function of current supplied to the laser and the pulse duration that is normally supplied to it anyway. At column 6, lines 27-34 it is stated:

Therefore, in order to obtain the same image density from a same image signal with a varied amount of laser light emission, it becomes necessary to regulate the pulse duration in response to the change in the amount of light emission. This is achieved, in the present embodiment, by employing a number of binary encoding circuits corresponding to the number of switched levels of the laser power.

Figure 5 depicts a logical flow chart diagram indicating that the particular choice of laser power to achieve the desired print density is a function of the CPU controlled clocking signals (pulse duration or pulse width modulation) provided. Note also in contrast Hayashi's prior art statement at column 1, at least at lines 18-29.

In any event, the approach taken in Hayashi appears consistent with that taken by appellant's disclosed invention in Figure 3, the subject matter of the chopping means of claim 1 on appeal, and appellant's disclosed approach to control the amount of light illuminating the photosensitive drum to adjust the density of the printed images.

Hayashi's approach is comparable to the analogous solutions provided by Tomita for light emitting diode exposure printing devices. Even though it is for a plurality of light emitting diode printing elements set forth in an array, Tomita does teach selectability of pulse signals based on different duty ratios according to the showing in Figure 6 relied upon by the examiner. The variable duty ratio discussions and showings in Figures 6-9

are comparable to the pulse width modulation teachings in Hayashi. By selective application of the pulse signature generator circuit 6 in Figure 6, along with its pulse signal selection circuitry 7, the chopping means or AND gate array 3 selectively chops the pixel data presented in shift register 4 before activation by the LED element array 1. Tomita effectively changes the power levels to the individual light emitting diode elements in a corresponding manner that Hayashi does so with respect to a laser emitting element.

To the extent the problems associated with appellant's admitted prior art exist as disclosed, Hayashi's approach appears to teach the solution of these problems for a similar, corresponding laser-based imaging device. In a corresponding, analogous manner, Tomita takes a similar approach for light emitting diode-based printing devices. In contrast to the appellant's admitted prior art approach in Figure 1 of the user selecting print density by the use of a selector switch to control the bias voltage to the developer associated with electrophotographic printing apparatus, both Hayashi and Tomita take a correspondingly similar approach as to what appellant has done to effectively control the amount of light illuminating photosensitive drum from the respective illuminating element, a laser in appellant's admitted prior art Figure 1 and in Hayashi and light emitting diodes in Tomita. In either case, the density of the printed

images is controlled by defining the amount of light exposed to the photosensitive drum in both secondary references in the corresponding manner as appellant does. In this light, it appears to us that the applied prior art still addresses the problem as well as the solution provided by appellant.

To the extent appellant argues that the purposes of the references relied upon by the examiner are different from the appellant's disclosed purpose, this is not necessarily pertinent to the issue and is essentially irrelevant if the prior art teachings would have led the artisan to construct an arrangement having the claimed structural features. In re Heck, 699 F.2d 1331, 216 USPQ 1038 (Fed. Cir. 1983) and In re Kronig, 539 F.2d 1300, 190 USPQ 425 (CCPA 1976). In re Heck also indicates that the use of patents as references is not limited to what the patentees described as their own

invention. The law of obviousness does not require that references be combined for reasons contemplated by an inventor, but only looks to whether the motivation or suggestion to combine references is provided by prior art taken as a whole. In re Beattie, 974 F.2d 1309, 24 USPQ2d 1040 (Fed. Cir. 1992). In an obviousness determination, the prior art need not suggest solving the same problem set forth by appellant. In re Dillon, 919 F.2d 688, 692-93, 16 USPQ2d 1897, 1901 (Fed. Cir. 1990)(en banc)(overruling in part In re Wright, 848 F.3d 1216, 1220, 6 USPQ2d 1959, 1962 (Fed. Cir. 1988)), cert. denied, 500 U.S. 904 (1991).

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In view of foregoing, appellant's request for rehearing is granted to the extent that we have in fact reviewed our findings, but is denied as to making any change therein.

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No time period for taking any subsequent action in connection with this appeal
may be extended under 37 CFR § 1.136(a).

DENIED

James D. Thomas
Administrative Patent Judge

Kenneth W. Hairston
Administrative Patent Judge

Stuart S. Levy
Administrative Patent Judge

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